

Tax Planning for the 21st Solar Century

By Charles Goulding, Jacob Goldman and Taylor Goulding

Charles Goulding, Jacob Goldman and Taylor Goulding describe tax planning opportunities to consider when contemplating various solar projects.

In recent full page newspaper ads, Sharp, the multinational electronics giant, touts the prediction that the 21st century is going to be “the solar century.” Consistent with its prediction, Sharp has also recently announced a large multibillion dollar investment in expanded solar panel manufacturing plant capacity. Regardless of the actual outcome of Sharp’s prediction, there is no question the solar sector is experiencing unprecedented growth.

Tax and financial advisors interested in this expanding area should consider engaging in important preparatory tax planning so their clients are thereby positioned to maximize the solar opportunity when ready.

Many federal tax advisors are familiar with the 30-percent commercial building solar tax credit and the five year accelerated depreciation, but are unaware of the substantial tax planning opportunities related to preparing for a solar project. The first section of this article describes the major categories of solar products and explains why, in the authors’ opinion, this is indeed “the solar century.” The second section of this article focuses on the types of tax planning that will maximize the facilities solar opportunity, regardless of whether the facility chooses a solar product.

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Types of Solar products

The two major categories of building solar products are: solar photo voltaic (P.V.) and solar thermal. Solar P.V. products use solar rays to generate electricity. Solar thermal systems use solar rays to heat hot water.

Solar Thermal

Solar Thermal products often have more favorable payback periods, meaning years to recoup the investment, and can provide substantial savings for facilities that need large quantities of hot water, including laundries, heated pools and hospital facilities.

Solar P.V.

When most Americans talk about solar, they mean solar P.V. The remainder of this article focuses on solar P.V. A forthcoming companion article will focus on the tax aspects of solar thermal. Solar P.V. generates extra electricity that can be used to provide electricity for the building or can be transferred to the electrical grid for use by others. The process of transferring solar electricity to the grid is sometimes called nega watts, or net metering.

Solar P.V. Economics

Solar P.V. has traditionally been quite expensive. The economic payback has been disappointingly unattractive, often exceeding seven years. Although many building owners intend to own a particular facility for more than seven years, at the front end of the decision seven years seems like a long time. Many

business facilities will not even look at a building energy reduction project unless it has a five year or less payback—and the clear preference is for projects with two to three year paybacks.

Solar P.V. Cost Components

It is the authors' opinion that there will be a huge increase in Solar P.V. installation resulting from a decline in the near-term price of solar installations.

According to a Lehman Brothers industry analysis, the cost of a P.V. solar system could fall by 50 percent by 2015. Lehman looked at the following cost elements:

Solar Cost Elements			
Cost Component	Cost/Watt		Cost Reduction %
	2008	2015	
Polysilicon	\$1.75	\$0.75	43%
Cell & Panel Processing	1.90	0.95	50%
Installation	3.45	1.75	51%

Some of the factors impacting each of the cost elements include:

Polysilicon

Polysilicon is the core material for building P.V. panels. Globally, there are now more manufacturers able to produce polysilicon in much larger quantities.

Cell and Panel Processing

Now that solar panel production volumes are so much higher, leading manufacturers are sensing economic opportunity and providing major know-how that is greatly improving cell and panel production. Applied Power, the huge semi-conductor assembly equipment manufacturer, is building automated cell manufacturing equipment. Boeing has announced extraordinary technology improvements at its wholly owned subsidiary, Spectrolab, Inc., which has now "achieved a new world record in terrestrial concentrator solar cell efficiency,"¹ commonly called "yield." Boeing has declared cell yield at the 40-percent level, which is a 100-percent improvement from the traditional 20-percent yield level, and has high hopes that they can "increase the conversion efficiency even higher."²

National Semiconductor, the large semi-conductor manufacturer, is using cell phone telephony technology concepts, called SolarMagic™, to optimize individual solar cell performance even when some cells are shaded. This technology recaptures up to 50 percent of what would otherwise be lost when energy shading occurs.³

Many leading manufacturers historically focused on other industries are entering the solar industry, including DuPont and Intel. In addition to demonstrating that these companies believe in future solar opportunities, they bring unique expertise that improves the industry.

Installation

Solar panel installers are becoming much more cost effective at installing rooftop P.V. Improved solar material is thinner and easier for installers to handle. Installers now use scanners that enable them to quickly locate the below roof rafters that panels are attached to. Also, installers can use enhanced computerized design tools to create drawings. The Lehman cost analysis did not cover reduced estimating costs, but the cost of estimating is decreasing since solar estimators can use Google earth to pre-qualify a solar roof project based on: roof size, southerly sun exposure and sun obstruction. Using address zip codes, the solar project estimator can plug the local utility electric rate and rebate scheme right into the cost estimation software.

Payback Criteria

There are multiple economic factors to consider when analyzing solar paybacks, including:

- Energy cost savings
- Utility rebates
- Tax savings
- Renewable Energy Certificates (Green Tags)
- Net metering
- Carbon emission reduction

Energy Cost Reduction

The energy cost savings from a P.V. installation is based on the existing electricity costs that can be eliminated and the revenues that can be earned from selling the excess electricity created.

Calculating current electricity costs savings is a straightforward calculation based on current electric charge rates. One challenge is that electricity costs continuously increase and forecasting future rates can be challenging. We have recently seen one year electricity costs as high as 70 percent in some jurisdictions which materially impacts the payback period.

Rebates

Utility rebates may or may not be available in a particular jurisdiction. Some states simply do not

offer solar rebates. Other jurisdictions may only offer rebates on a first come first served basis pursuant to grants that sometimes run out of funding. Many companies use rigid capital authorization processes that will not allow for consideration related to investment approval unless the utility rebate is certain.

Tax Savings

Tax savings at federal, state and local levels may or may not be available.

The federal 30-percent solar credit that expired on December 31st, 2008 was replaced by the credit for investment in advanced energy facilities. The credit for investment in advanced energy facilities, which was added by the American Recovery and Reinvestment Tax Act of 2009, applies to qualified property constructed, reconstructed or erected by the taxpayer after February 18, 2009, to the extent of the cost attributable to construction, reconstruction or erection of the qualified property after February 18, 2009, and to acquisitions of qualified property made after February 18, 2009, and placed in service after February 18. For any qualified property having a

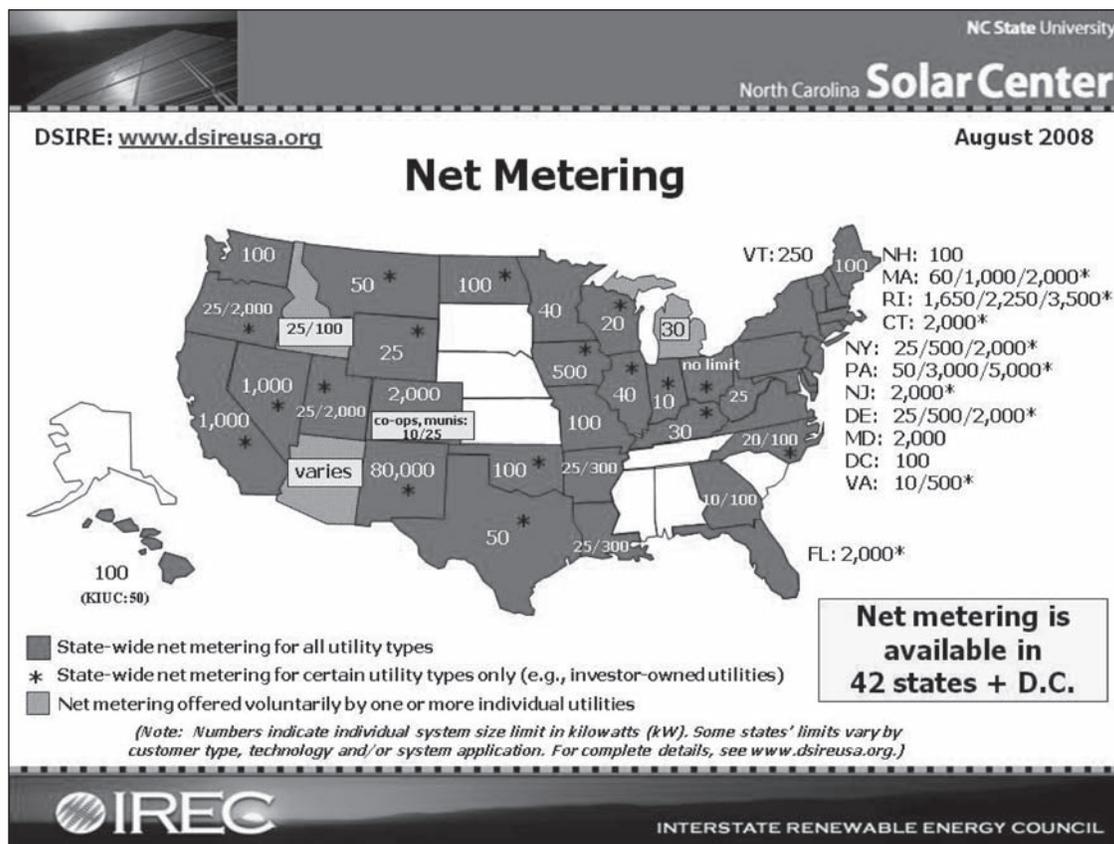
normal construction period of more than two years, the 30-percent credit will apply to expenditures made after February 18, 2009.

Renewable Energy Certificates

Renewable Energy Certificates (Green Tags) provide an economic incentive for the creation of renewable energy, as “the green energy generator is credited with one [Renewable Energy Credit] REC for every 1,000 kWh of electricity it creates.”⁴ For example, a company can accumulate RECs through the installation of solar P.V. panels or any other use of alternative energy. These certificates may then be sold to purchasers with either voluntary or mandatory alternative energy usage commitments.

Net Metering

One of the most important economic opportunities is net metering, which enables the solar electricity generator to sell the extra electricity generator back into the grid at market or market plus rates. The (DSIRE) chart demonstrates that net metering is now available in 42 states and Washington D.C.



¹ “Net Metering.” Interstate Renewable Energy Council as presented by the Database of State Incentives for Renewables & Efficiency (www.dsireusa.org).

Preparatory Solar P.V. Tax Planning

First Make the Facility Energy Efficient

One of the first steps of a solar specifier is to analyze a building's current energy use to prepare the economic payback proposal. A building should be made as energy efficient as possible before installing solar P.V., otherwise the extra electricity being generated by the P.V. system is simply being wasted and the amount of extra electricity available to sell into the grid for an enhanced economic return will be diminished.

The most direct path to building energy reduction is to install an energy efficient lighting system and an energy efficient heating, ventilation and air conditioning (HVAC) system.

Install Energy Efficient Lighting

Energy efficient lighting may be eligible for immediate 60 cent per square foot EPAct tax deductions.⁵ Energy efficient lighting often provides a very lucrative economic payback period and that is sometimes sub two or even sub one year.

Replacing the Existing HVAC

Many buildings have large rooftop HVAC package units or chillers that provide the building's heating and air conditioning. When this equipment is at our near the end of its life cycle there are two reasons to consider replacing in anticipation of a possible solar project:

1. to obtain the electricity usage reduction related to the more efficient replacement equipment to enhance the benefit from the P.V. electrical generation and
2. to properly create the solar roof top layout, since the panels must be designed to function around both the HVAC unit profile and the resultant shadows created by the HVAC equipment enclosure.

When replacing roof top packages or chillers on an existing building it has been possible to qualify for repair and expense treatment for tax purposes.⁶

Roof Replacements

One of the most common steps before installing rooftop P.V. is to replace the existing roof. Accordingly, building owners need to first analyze their roof replacement life cycle. Obviously it makes no sense to install solar panels on the top of roof that is nearing the end of its life cycle.

When replacing an existing roof with similar roof it is possible to qualify for repair expense treatment for tax purposes, depending on the facts and circumstances.⁷

Conclusion

The decision to install rooftop P.V. is an expensive decision often requiring extensive analysis. Before making the final decisions, preparatory energy equipment related tax planning can result in an enhanced economic return from the P.V. solar project.

ENDNOTES

¹ Randall Parker, *Boeing Spectrolab Achieves 40% Solar Cell Efficiency*, FUTUREPUNDIT, Dec. 11, 2006, available at www.futurepundit.com/archives/003956.html.

² *Id.*

³ SolarMagic™ Technology, *National Semiconductor*, available at www.national.com/analog/solarmagic, last visited Feb. 2009.

⁴ Thomas P. DiNapoli, Office of the New York

State Comptroller, *Green Best Practices: How Local Governments Can Reduce Energy Cost and Minimize Impact on Global Climate Change*, available at www.osc.state.ny.us/localgov/pubs/research/research-brief_green.pdf, last visited Feb. 2009.

⁵ See Charles Goulding, Jacob Goldman and Siddarth Sheth, *Tax Deductions Brighten Lighting Upgrades*, CORP. BUS. TAX'N

MONTHLY, Oct. 2007, at 23.

⁶ See Charles Goulding, Jacob Goldman and Nicole DiMarino, *The Tax Aspects of HVAC Package Unit Replacement Programs*, CORP. BUS. TAX'N MONTHLY, July 2008, at 19.

⁷ See Charles Goulding, Jacob Goldman and Taylor Goulding, *The Tax Aspects of Roof Replacements*, CORP. BUS. TAX'N MONTHLY, Oct. 2008, at 27.